MULTIMEDIA **UNIVERSITY**

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FINAL EXAMINATION

TRIMESTER 1, 2016/2017

TCP1121 – COMPUTER PROGRAMMING
(All sections / Groups)

8 OCT 2016
2.30 p.m – 4.30 p.m
(2 Hours)

Question	Mark

Total:

Examiner 1 Signature: _____

Examiner 2 Signature: _____

INSTRUCTIONS TO STUDENT

1. This question paper consists of 13 pages, including the cover page, with 5 Questions only.

2. Attempt **ALL THREE** questions in **Section A**.

3. Attempt **ONE out of TWO** questions in **Section B**. All questions carry equal marks and the distribution of the marks for each question is given.

4. Please print all your answers **CLEARLY** in the specific answer boxes provided for each question. Submit this question paper at the end of the examination.

SECTION A: Please attempt ALL THREE questions.

<u>**Question 1**</u>

a. Name and briefly explain TWO (2) common methods for terminating an input loop.

[2 marks]

b. What is the output produced by executing the following code segments (given that they are embedded in a correct program)?

[2 marks]

i.
```
for (int i=2; i<=6; i++) {
        for (int j=2; j<i; j++)
                cout << "*" << " ";
                cout << "\n";
}
```

ii.
```
int x = 1;
while (x != 13)
{
        cout << x << " ";
        x = x + 3;
}
```

Continued...

c. The code segment below has a compile error, identify and correct the error.

[1 mark]

```
int small_num = 1;
if (0 < small_num < 10)
++small_num;
```

d. Based on the class Test below, fill up the right column of the table according to the types of the members specified in the left column.

[3 marks]

```
class Test {
        int x;
        static int y;
    public:
        Test();
        Test (int a);
        Test (const Test&);
        ~Test();
        int getX();
        static int getY();
        void setX (int x);
};
```

Overloaded constructor(s):	
Copy constructor(s):	
Destructor(s):	
Update method(s):	
Query method(s):	

e. Identify the problem of the multiple inheritance. Suggest a way to avoid the problem.

[2 marks]

Question 2

a. Translate the following instruction to C++ code.

i.   Create an array of type integer and initialize it with values 1,4,3,8 and 7.
ii.   Declare a pointer called *ptr* and have it point at the address of the element 2 of the array.
iii. Using pointer *ptr* output the value of the element 3 of the array (its value is 8).

[3 marks]

b. What is the output produced by executing the following code segments (given that they are embedded in a correct program)?

[2 marks]

i.
```
int x[6] = {100, 3, 1, 0, 1, 22};
cout << x[ x [ x[1] ] ];
```

Continued...

```
ii.   int add_me(int num2)
      {     int num1 = 12;
      return num1 + num2;
      num1 += 3;
      }

      int main()
      {     cout << add_me(12) << endl;
      return 0;
      }
```

c. Considering the following main function, write the definition for the set function to ask the user for the length and width of a rectangle. Assume that the function definition will be placed before the main function.

[3 marks]

```
int main(){
int length, width;
set (length,width);
cout << "The area of the rectangle is: "<< length*width;
return 0;
}
```

A sample output is as follows.

```
Key in the length: 6
Key in the width: 8
The area of the rectangle is: 48

Process exited after 2.974 seconds with return value 0
Press any key to continue . . .
```
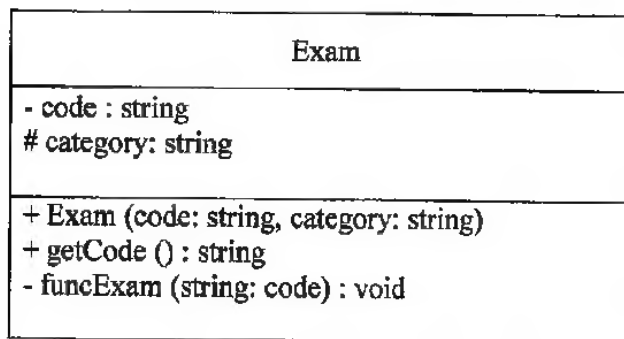
d. Write the C++ code for the following instructions.

[2 marks]

i. Create a dynamic variable of type double using a pointer called `ptr`.
ii. Free the memory pointed to by pointer `ptr`.

Question 3

a. Write the class declaration by using the Class Diagram below.   [3 marks]
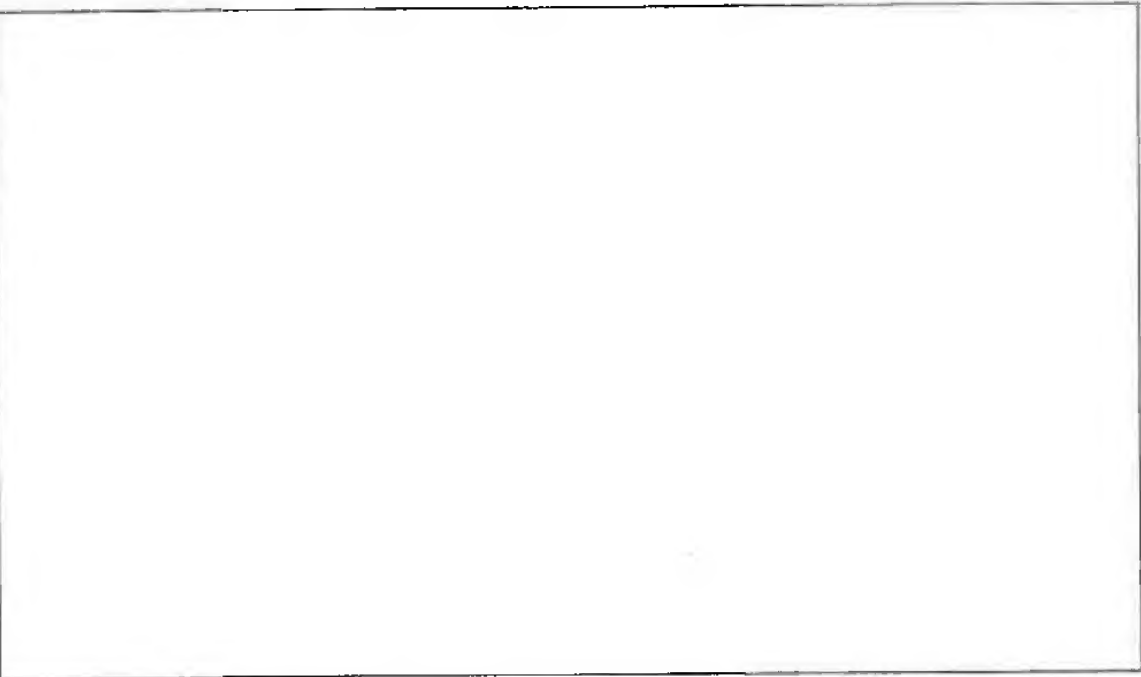
Exam
- code : string # category: string
+ Exam (code: string, category: string) + getCode () : string - funcExam (string: code) : void

b. Write a class called `Receipt` for an item sold at the store with the following attributes and methods.   [2 marks]

i. Attribute `item` of type string and attribute `price` of type double.
ii. Default constructor that initializes attribute `item` to "name" and `price` to `0.1`.
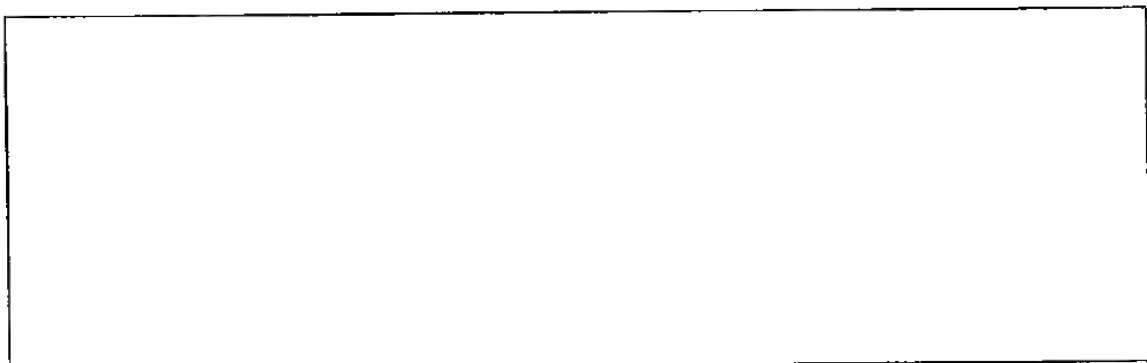iii. Overloaded constructor that initializes all attributes.

c. Rewrite and complete the classes below to produce the output as shown.

[2 marks]

```
class X {
    . . .
};

class Y: public X {
    . . .
};

int main() {   //Do Not modify the main()
  X *p = new X;
  p->display();   //Output = aa
  delete p;
  p = new Y;
  p->display();   //Output = cc
}
```

d. Rewrite and transform the following class definition into an abstract class.

[1 mark]

```
class Memo{
     public:
          void message() { cout<<"Meeting"; }
};
```

e. Complete the class definition for class Exam, so that the program would be able to run and produce the output 5.
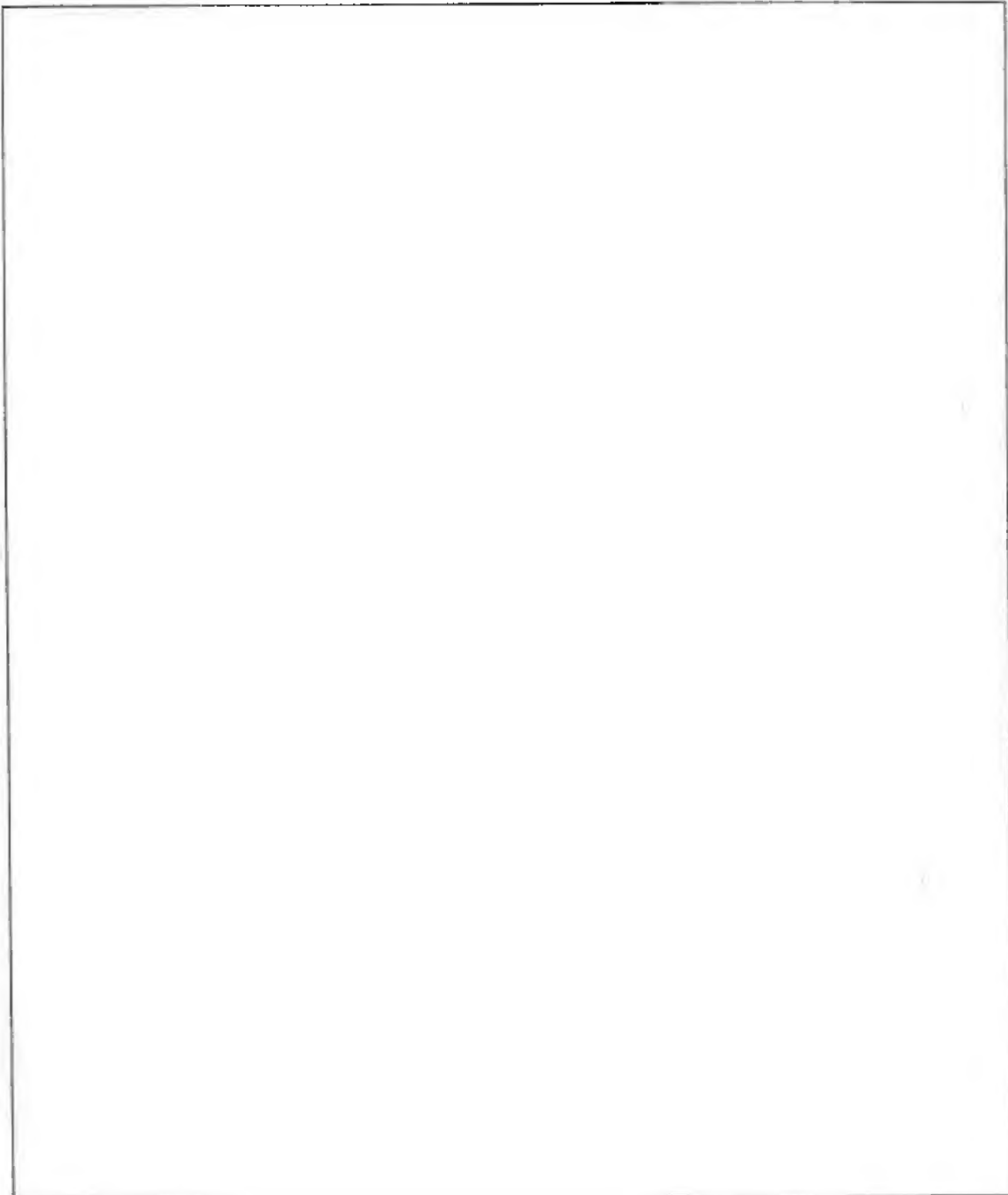
[2 marks]

```
class Exam{
     int num;
```

```
};
void showID (Exam a){     cout << a.num << endl;     }
int main(){
     Exam a(5);
     showID(a);
}
```

Continued...

SECTION B: Please attempt **ONE** out of **TWO** questions only.

Question 4

a. Draw a flowchart for a program that accepts 10 integers from the user, calculates the sum of the even numbers and displays the results on the screen. Assume that the user will only input positive integers. If all numbers entered are odd, then the sum is 0.
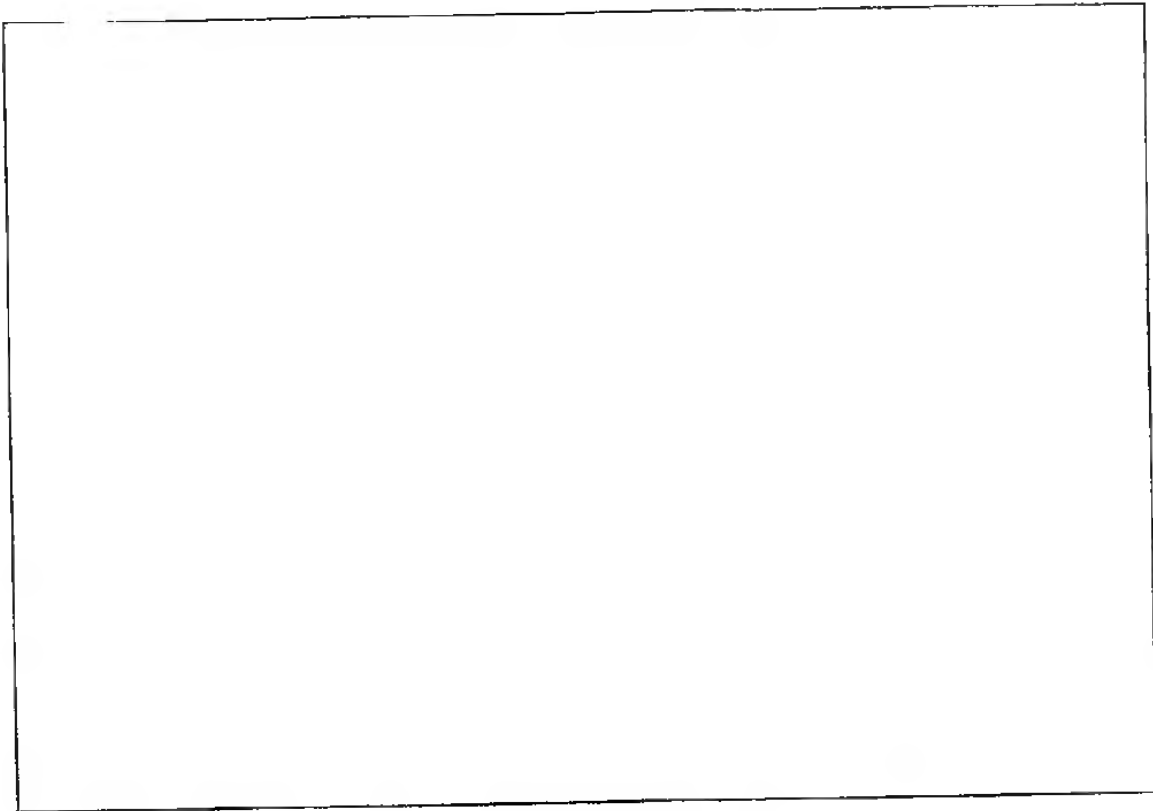
[3 marks]

Continued...

b. Write a complete program for the flowchart drawn in the above question 4(a).

[2 marks]

c. Construct the class definitions for the 3 classes that have the attributes and methods as mentioned:

[5 marks]

Class Employee:
    Attribute: *private string name*
    Method: *public overloaded constructor*

Class Permanent:
    Inherits from class Employee
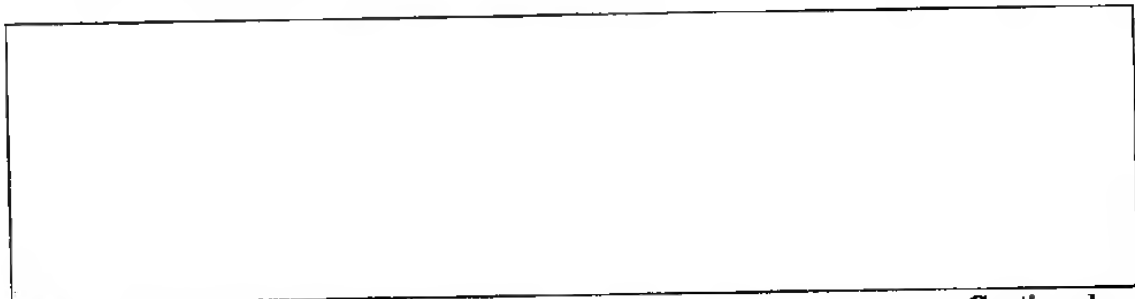   Attribute: *private double allowance*
    Method: *public overloaded constructor*
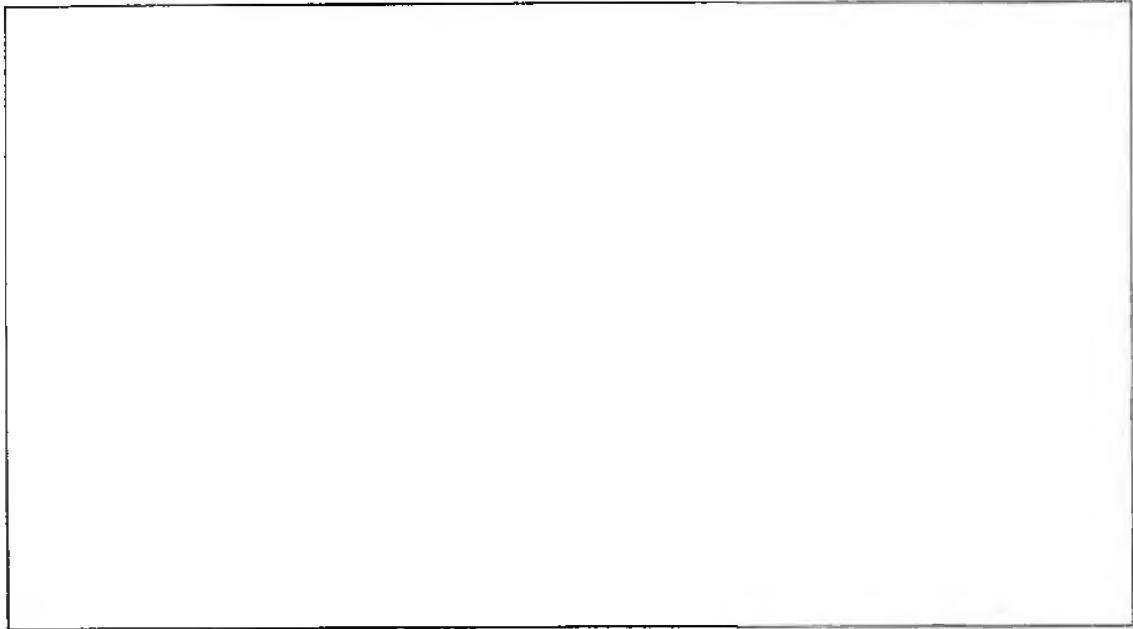
Class Admin:
    Inherits from class Permanent
    Attribute: *none*
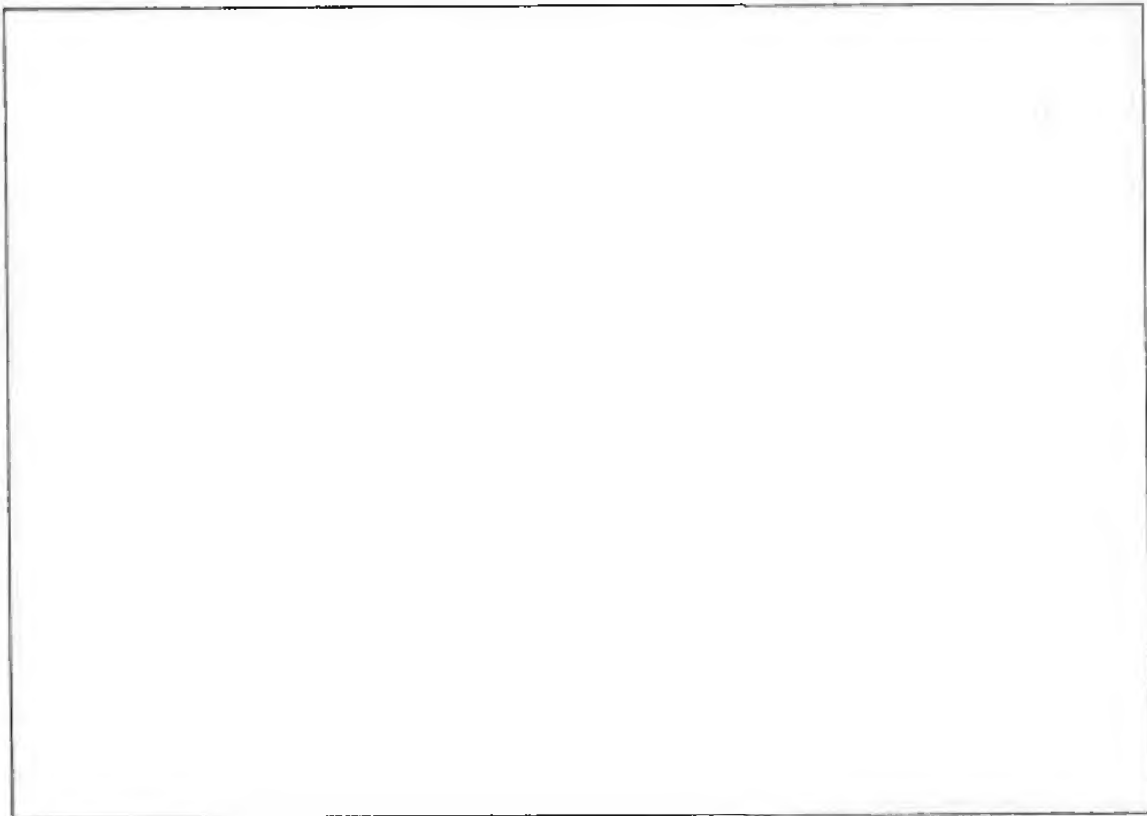   Method: *public overloaded constructor*

Continued...

Question 5

a. With the aid of flowchart and brief explanation, demonstrate the difference between a while loop and a do-while loop.
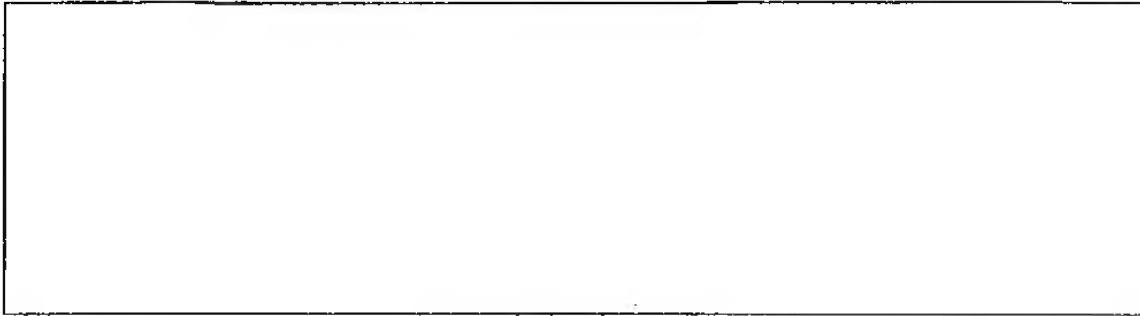
[3 marks]

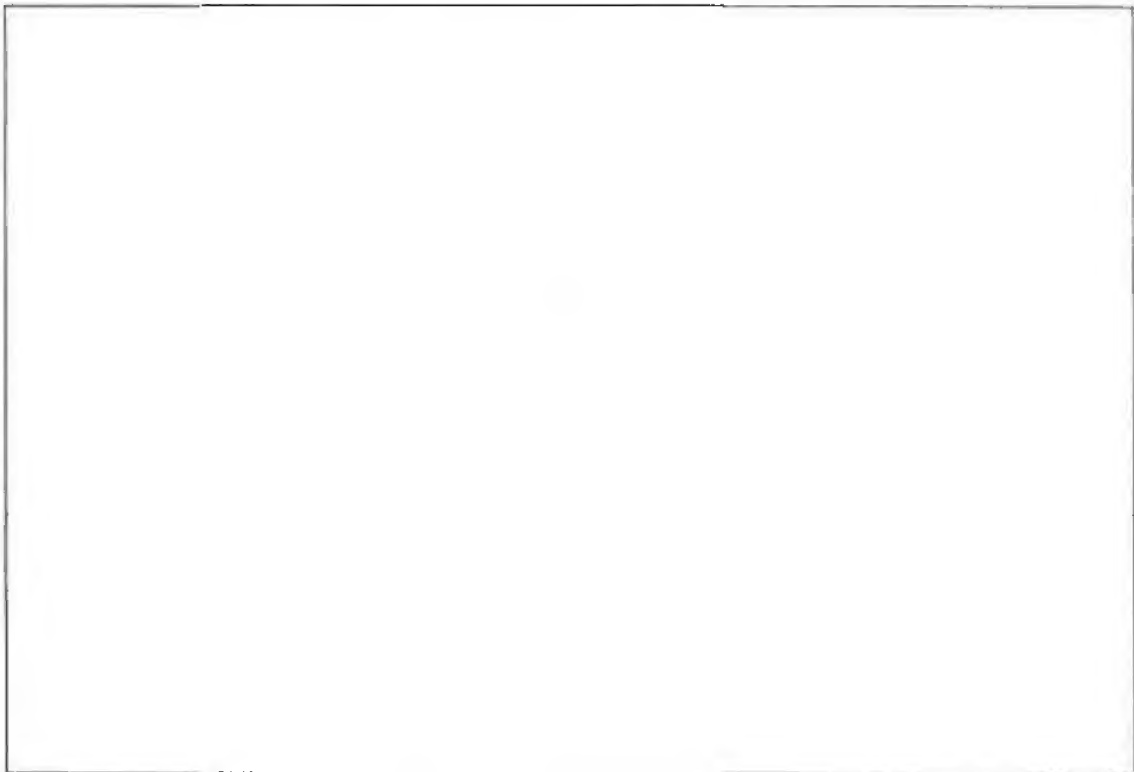b. Express a situation that you need to consider using a dynamic array?

[2 marks]

c. Change the following program using Exception Handling. The program decides the fee to be paid by the user based on the number of hours.

[3 marks]

```
int main(){
  double hour;
  cout << "Number of hours: ";
  cin >> hour;
  if (hour < 1)
    cout << "Minimum number of hours is 1. Try again.\n";
  else
    cout << "Fee is RM"<<hour*2<<".\n";
}
```

Continued...

d. Apply a function template named print() to the following program. The output is shown as below.

[2 marks]

```cpp
#include <iostream>
using namespace std;

int main(){
    char c = 'X';
    double d = 3.67;
    print( c );    //output = X
    print( d );    //output = 3.67
}
```


End of Paper